Scalable and Robust Fraud Detection in Distributed Systems

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Abstract*: The rise of distributed systems has increased the need for advanced fraud detection mechanisms. Cybercriminals increasingly exploit the distributed and decentralized nature of these systems, posing challenges for traditional fraud detection techniques that rely on centralized data analysis. In this paper, we propose a novel approach to fraud detection that is decentralized, scalable, and capable of real-time detection across diverse nodes in distributed systems. Our solution combines machine learning techniques, including anomaly detection and classification algorithms, with decentralized consensus mechanisms. We evaluate our approach using a large-scale financial dataset and outline its performance in terms of accuracy, latency, and scalability. This work also discusses challenges such as data privacy, adversarial attacks, and regulatory compliance, providing directions for future research.*

Keywords: Distributed Systems, Fraud Detection, Machine Learning, Artificial Intelligence